

Scott M. Matheson
Governor



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Executive Director
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STATE OF UTAH
DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
150 West North Temple, P.O. Box 2500, Salt Lake City, Utah 84110-2500

file
North City

August 22, 1984
533-6108

RECEIVED

Kenneth Lee Alkema, Director
Room 474 801-533-6121

SEP 14 1984

DIVISION OF OIL
GAS & MINING

JIM

SEP 17 1984

RE: Intent to Approve Gold & Silver
Tailing Reclaim Process, Juab
County

Dear Mr. Lee:

Plans and specifications for your proposal to construct a gold and silver tailing reclaim process have been evaluated and have been found to be consistent with the requirements of the Utah Air Conservation Regulations (UACR) and the Utah Air Conservation Act.

The Executive Secretary will publish notice of intent to issue an approval order in the Salt Lake Tribune and Deseret News on August 27, 1984. A 30-day period following the publishing date will be allowed during which your proposal and the Executive Secretary's evaluation of the impact on air quality will be available for review and comment. If within 15 days of publication of notice anyone so requests, a hearing will be held.

Unless modified, the approval order would be based upon the following operating conditions:

1. The mill and site shall be constructed according to the plans and specifications submitted with the notice of intent dated June 8, 1984, the information reported at the predesign conference on May 25, 1984, and the Oil, Gas & Mining Plan dated August 25, 1983, revised May 30, 1984.
2. Visible emissions from any point in the system shall not exceed 20% opacity as measured by EPA Reference Method 9, 40 CFR Part 60 Appendix A.
3. Haul road fugitive emissions shall be controlled by application of water two times per eight hour shift unless daily precipitation exceeds 0.05 inches of water.
4. The Executive Secretary shall be notified upon startup as an initial compliance inspection is required.

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PROPOSED TAILS DISPOSAL AND RECLAMATION

Lee Mining wants to achieve neutralization and detoxification of its tailings discharge by use of a horizontal belt filter, so that, the waste product can be used to reclaim the site. The solution from the filtration process is recycled as part of the requirement for the Mill Water System. Because of the low cake moisture content, the tails do not need to be impounded to be contained on the site.

Enclosed you will find Plate I that depicts the site as it is now. Numerous excavations and foundations exist. Our legal department suggest that these foundations, which are equivalent to 20-30 feet cliffs, be dealt with as quickly as possible. The company feels the best way to eliminate the hazards including the numerous excavations, is to fill them with process waste. Since the contemplated material for disposal is "toxic" as described by Rule M-2 (K), Lee Mining has retained the Colorado School of Mines Research Institute to develop a technique, which would render the tailings harmless, so as to comply with Rule M-10, Reclamation Standards, Section (6) for Toxic Materials of the Mined Reclamation Act, Title 40-8. The Research Institute has developed such a process for neutralization of the tails and Lee Mining believes they should be permitted to use such a process in restoration of the site that has been marred by excavations and old ruins.

The Plan

The Plan, consisting of six parts, is best demonstrated by a graphical display presented in Figure II. These parts include: a vacuum, filtration separation of gold bearing solution from pulp, two stages of counter current wash, neutralization by closed loop chlorination of the filter cake, cake oxidation and cure, disposal of cake to appropriate site, and finally revegetation of filled areas.

In Part 1, the pulp from agitated cyanide leach is distributed evenly over the belt filter. The belt speed is controlled to obtain a cake thickness of $\pm 3/8$ of an inch. The filter cloth retains the solids and the solution reports to the pregnant storage holding tank.

In Part 2, the cake advances on the belt and is washed in two stages. A diluted wash solution passes through the cake twice and lowers its cyanide content. The wash solution passes through activated charcoal and it is recycled to the Mill Water Storage System.

The filter cake in Part 3, low in cyanide after the wash, is advanced to near the end of the belt. A solution containing 1.31 wt. % NaOCl is flooded on to the cake. The vacuum pulls the solution thru the cake, so that, 100% of the material is contacted by the neutralizing solution. The filtrate then goes to storage where the depleted solution is brought back to its original strength. The cycle is repeated.

Part 4 involves "curing the cake", which means sufficient time at atmospheric conditions must be given for oxidation of the cake to be complete, so that, any cyanide remaining in the residue will be completely oxidized. This time was determined to be 16 hours by the Colorado School of Mines Research Institute. However, greater reliability would be obtained by extending the curing period one to two days.

Self monitoring test are planned periodically generally with daily production, to ensure neutralization of the tailings before going to land fill. Justification for neutralization is given in a report by the Colorado School of Mines Research Institute titled "Detoxification North Lilly / Dragon Consolidated Cyanide Leach Tailings", which appears in Appendix A.

The land fill of Part 5 of the plan calls for removal of the cured cake and application at the southern end. The site will be filled from south to north as the project proceeds. The tails contain the proper moisture so that, they can be wheel compacted.

In Part 6 native vegetation will be applied to the tails. Experimental patches will be applied as the land fill advances from south to north. The ultimate goal of the project is best illustrated in Plate III.

We feel that our method for achieving neutralization of tailings, utilizing belt filtration, is far superior to the requirements established for cyanide heap leach dumps. We believe our plan offers a sensible way for disposing of waste products, while using them to restore the site.